

Electrical Circuits (2)

Sheet 5 – Natural and step response of RLC parallel circuits

1. The two switches in the circuit seen in Fig.1 operate synchronously. Switch 1 has been in position (a) for a long time. At $t = 0$, the switches move to their alternate positions. Find $v_o(t)$ for $t \geq 0$.

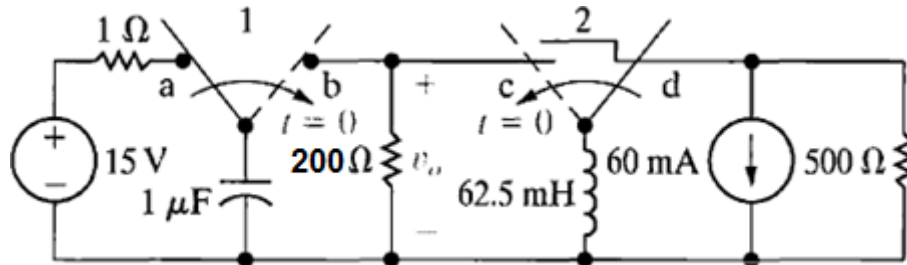


Fig. 1

2. The resistor in the circuit of Fig. 1 is increased from $100\ \Omega$ to $125\ \Omega$. Find $v(t)$ for $t \geq 0$.
3. Assume that at the instant the 60 mA dc current source is applied to the circuit in Fig. 2, the initial current in the 50 mH inductor is -45 mA , and the initial voltage on the capacitor is 15 V . Find the expression for $i_L(t)$ for $t \geq 0$.

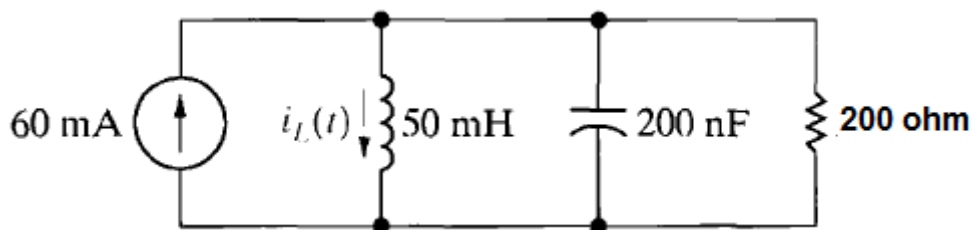


Fig. 2

4. The switch in the circuit in Fig. 3 has been open a long time before closing at $t = 0$. Find $i_L(t)$ for $t \geq 0$.

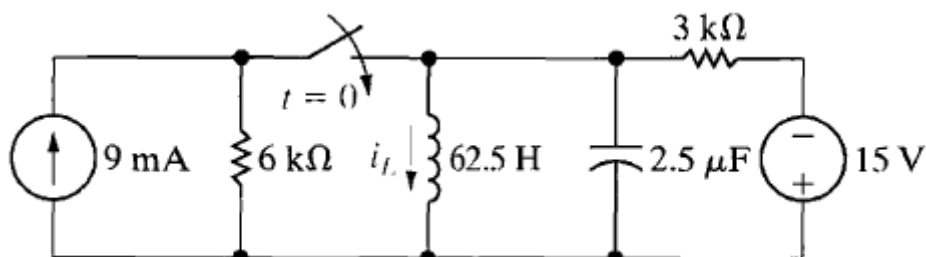


Fig. 3